

IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

- 1 1. (Currently Amended) A program storage device readable by a computer,
2 the program storage device medium tangibly embodying one or more programs of
3 instructions executable by the computer to perform a method for determining a size of a
4 last data block processed in a storage system , the method comprising:
5 detecting ~~a characteristic of a data channel gate signal indicating a length of data;~~
6 initiating a counter for counting to a predetermined count upon detection of the
7 gate signal;
8 resetting the counter each time the predetermined count is reached;
9 deasserting the gate signal a programmable length before the end of the last data
10 byte;
11 stopping the counter upon deassertion of the gate signal; and
12 ~~determining the length of data based on the detection of the characteristic; and~~
13 calculating a size of a last data block ~~in the length of data based on the determined~~
14 length according to a remainder in the counter after the counter is stopped.

- 1 2. (Original) The program storage device of claim 1, wherein the
2 detecting the characteristic of the data channel gate signal further comprises detecting a
3 transition of a read-gate signal and a write-gate signal for indicating the last data block in
4 the length of data.

1 3. (Original) The program storage device of claim 2, wherein the
2 detecting the transition of the write-gate signal further comprises detecting a de-assertion
3 of write-gate signal $M1$ bytes before the end of a data sector being written to provide the
4 size of the last data block (R), the size of the last data block (R) equals $\text{MOD}(K+M1, L)$,
5 wherein K is a determined length count number, $K+M1$ equals the sector size N and L
6 equals a codeword size.

1 4. (Original) The program storage device of claim 2, wherein the
2 detecting the transition of the read-gate signal further comprises detecting a de-assertion
3 of read-gate signal $M2$ bytes before the end of a data sector being read to provide the size
4 of the last data block (R), the size of the last data block (R) equals $\text{MOD}(K+M2, L)$,
5 wherein K is a determined length count number, $K+M2$ equals the sector size N and L
6 equals a codeword size.

1 5. (Original) The program storage device of claim 2 further comprising
2 decoding the last data block after reading the last data block from a medium.

1 6. (Original) The program storage device of claim 5, wherein the
2 decoding the last data block further comprises using parity post-processing and run-
3 length-limited decoding schemes.

1 7. (Original) The program storage device of claim 1, wherein the
2 calculating the size of a last data block further comprises calculating a modulo (MOD) of
3 sector size (N) and codeword size (L) to provide the size of the last data block (R),
4 wherein the size of the last data block (R) equals $\text{MOD}(N, L)$.

1 8. (Original) The program storage device of claim 1 further comprising
2 encoding the last data block before writing the last data block to a medium.

1 9. (Original) The program storage device of claim 8, wherein the
2 encoding the last data block further comprises using parity and run-length-limited
3 encoding schemes.

1 10. (Original) The program storage device of claim 1 further comprising
2 applying parity encoding/decoding on the last data block without padding additional
3 bytes.

1 11. (Currently Amended) A read/write channel device comprising:
2 a signal processor for detecting ~~a characteristic of~~ a data channel gate signal
3 ~~indicating a length of data~~ the gate signal being deasserted a programmable length before
4 the end of the last data byte; and
5 a counter ~~for determining the length of the data based on the detection of the~~
6 ~~characteristic~~ for counting to a predetermined count upon detection of the gate signal, the
7 counter being reset each time the predetermined count is reached and stopped upon
8 deassertion of the gate signal; the counter providing a ~~and for calculating the size of a last~~
9 data block in the length of data ~~based on the determined length~~ according to a remainder
10 in the counter after the counter is stopped.

1 12. (Original) The read/write channel device of claim 11, wherein the
2 signal processor further comprises a read-gate and a write-gate for indicating the last data
3 block in the length of data.

1 13. (Original) The read/write channel device of claim 12, wherein the
2 write-gate provides a signal Ml bytes before the end of a data sector being written to
3 provide the size of the last data block (R), the size of the last data block (R) equals MOD
4 $(K+Ml, L)$, wherein $K+Ml$ equals the sector size N and L equals a codeword size.

1 14. (Original) The read/write channel device of claim 12, wherein the
2 read-gate provides a signal $M2$ bytes before the end of a data sector being read to provide
3 the size of the last data block (R), the size of the last data block (R) equals $\text{MOD}(K + M2,$
4 $L)$, wherein $K + M2$ equals the sector size N and L equals a codeword size.

1 15. (Original) The read/write channel device of claim 11 further
2 comprising a decoder for decoding the last data block after reading the last data block
3 from a medium.

1 16. (Original) The read/write channel device of claim 15, wherein the
2 decoder further comprises a post-processor for providing parity post-processing and a
3 channel decoder for providing run-length-limited decoding schemes.

1 17. (Original) The read/write channel device of claim 11, wherein the
2 counter calculates a modulo (MOD) of sector size (N) and codeword size (L) to provide
3 the size of the last data block (R), wherein the size of the last data block (R) equals MOD
4 (N, L).

1 18. (Original) The read/write channel device of claim 11 further
2 comprising an encoder for encoding the last data block before writing the last data block
3 to a medium.

1 19. (Original) The read/write channel device of claim 18, wherein the
2 encoder further comprises a channel encoder and a parity encoder for providing parity
3 and run-length-limited processing.

1 20. (Original) The read/write channel device of claim 11 further
2 comprising an encoder/decoder for applying parity on the last data block without padding
3 additional bytes.

1 21. (Currently Amended) A storage system for determining sector block sizes
2 using existing controller signals, comprising:

3 a storage medium for storing data thereon, the storage medium formatted for a
4 predetermined sector length;

5 a transducer, operatively coupled to the storage medium, for reading and writing
6 data on the storage medium; and

7 a read/write channel device for determining a size of a last data block, comprising

8 a signal processor for detecting ~~a characteristic of~~ a data channel gate

9 signal ~~indicating a length of data~~ the gate signal being deasserted a programmable length

10 before the end of the last data byte; and

11 a counter to ~~determine the length of the data based on the detection of the~~

12 ~~characteristic~~ for counting to a predetermined count upon detection of the gate signal, the

13 counter being reset each time the predetermined count is reached and stopped upon

14 deassertion of the gate signal; the counter providing a ~~and to calculate the size of the a~~

15 last data block in the length of data ~~based on the determined length~~ according to a

16 remainder in the counter after the counter is stopped.

1 22. (Original) The storage system of claim 21 further comprising a

2 storage controller for generating both a write-gate signal and a read-gate signal to the

3 read/write channel, and for generating NRZ data to read/write channel for writing and for

4 receiving NRZ data from read/write channel for reading.

1 23. (Original) The storage system of claim 21, wherein the signal
2 processor further comprises a write-gate and a read-gate for indicating the last data block
3 in the length of data.

1 24. (Original) The storage system of claim 23, wherein the write-gate
2 provides a signal $M1$ bytes before the end of a data sector being written to provide the
3 size of the last data block (R), the size of the last data block (R) equals $\text{MOD}(K + M1, L)$,
4 wherein $K + M1$ equals the sector size and L equals a codeword size.

1 25. (Original) The storage system of claim 23, wherein the read-gate
2 provides a signal $M2$ bytes before the end of a data sector being read to provide the size
3 of the last data block (R), the size of the last data block (R) equals $\text{MOD}(K + M2, L)$,
4 wherein $K + M2$ equals the sector size and L equals a codeword size.

1 26. (Original) The storage system of claim 21 further comprising a
2 decoder for decoding the last data block after reading the last data block from a medium.

1 27. (Original) The storage system of claim 26, wherein the decoder
2 further comprises a post-processor for providing parity post-processing and a channel
3 decoder for providing run-length-limited decoding schemes.

1 28. (Original) The storage system of claim 21, wherein the counter
2 calculates a modulo (MOD) of sector size (N) and codeword size (L) to provide the size
3 of the last data block (R), wherein the size of the last data block (R) equals $\text{MOD}(N, L)$.

1 29. (Original) The storage system of claim 21 further comprising an
2 encoder for encoding the last data block before writing the last data block to a medium.

1 30. (Original) The storage system of claim 29, wherein the encoder
2 further comprises a channel encoder and a parity encoder for providing parity and run-
3 length-limited processing.

1 31. (Currently Amended) A means for determining the size of a last data
2 block processed in a storage system comprising:
3 ~~means for detecting a characteristic of a data channel gate signal indicating a~~
4 ~~length of data;~~
5 ~~means for determining the length of data based on the detection of the~~
6 ~~characteristic; and~~
7 ~~means for calculating the size of a last data block in the length of data based on~~
8 ~~the determined length~~
9 means for detecting a data channel gate signal;
10 means for initiating a counter for counting to a predetermined count upon
11 detection of the gate signal;
12 means for resetting the counter each time the predetermined count is reached;
13 means for deasserting the gate signal a programmable length before the end of the
14 last data byte;
15 means for stopping the counter upon deassertion of the gate signal; and
16 means for calculating a size of a last data block according to a remainder in the
17 counter after the counter is stopped.

1 32. (Currently Amended) A method of determining a size of a last data block
2 processed in a storage system comprising:
3 ~~detecting a characteristic of a data channel gate signal indicating a length of data;~~
4 ~~determining the length of data based on the detection of the characteristic; and~~
5 ~~calculating a size of a last data block in the length of data based on the determined~~
6 ~~length~~
7 detecting a data channel gate signal;
8 initiating a counter for counting to a predetermined count upon detection of the
9 gate signal;
10 resetting the counter each time the predetermined count is reached;
11 deasserting the gate signal a programmable length before the end of the last data
12 byte;
13 stopping the counter upon deassertion of the gate signal; and
14 calculating a size of a last data block according to a remainder in the counter after
15 the counter is stopped.